

WHAT IS CLAIMED IS:

1. An information processing device for aiding operations relating to position and orientation of a virtual object positioned in three-dimensional space, said device comprising:

image-taking means for taking images in real space in order to display said virtual object in a superimposed manner on real space;

synthesizing means for synthesizing a virtual object with said taken image;

operating means for operating the position and orientation of said virtual object; and

aiding means for obtaining a three-dimensional position of real space from external instructions, and obtaining a constraining shape for aiding in operations for the position and orientation of said virtual object;

wherein the position and orientation of said virtual object are operated by instructions from said operating means, based on constraint conditions based on the constraining shape obtained by said aiding means.

2. An information processing device according to Claim 1, wherein said constraining shape is a shape in which a three-dimensional position in real space obtained by

external instructions is configured of an apex or a component plane.

3. An information processing device according to Claim 1, wherein the following operations of the position and orientation of said virtual object can be made using said operating means:

translation transformation following said constraining shape; and

rotation transformation on an axis which is a normal vector at a plane where said constraining shape and said virtual object come into contact.

4. An information processing device according to Claim 1, wherein said virtual object is subjected to three-dimensional transformation by operations of said operating means, such that the position of said operating means on a two-dimensional screen and the position of said virtual object on a two-dimensional screen are synchronized.

5. An information processing method for aiding operations relating to position and orientation of a virtual object positioned in three-dimensional space, said method comprising:

a measurement step obtaining external parameters

indicating the position and orientation of image-taking means in order to fixedly display said virtual object in real space;

an operating step for operating the position and orientation of said virtual object;

an aiding step for adding constraint to the operations of operating means so as to aid the operations of said virtual object;

an input step for inputting a constraining shape to be a reference for generating said constraint;

a synthesizing step for synthesizing pictures of real space obtained by image-taking means, and pictures of said virtual object estimated from the position and orientation of said image-taking means;

wherein the position and orientation of said virtual object in said operating step is transformed in said aiding step with said constraining plane as a reference, thereby aiding operations.

6. An information processing method according to Claim 5, wherein said input step obtains three-dimensional position in real space from external instructions.

7. An information processing method according to Claim 6, wherein a virtual image indicating said input virtual

shape is synthesized with an image of said real space and pictures of said virtual object.

8. A computer program, wherein the information processing method according to Claim 5 is executed by a computer device.

9. A computer-readable recording medium, storing the computer program according to Claim 8.

10. An information processing method for operating the position and orientation of a virtual object in compounded real space obtained by synthesizing pictures of real space and a virtual object, said method comprising:

a step for obtaining a constraining shape serving as constraint conditions, from a plurality of positions in real space instructed by a user using an operating unit capable of obtaining three-dimensional positional information;

a step for changing the position and orientation of said virtual object according to instructions from the user, with said obtained constraining shape as constraint conditions; and

a step for synthesizing an image of the virtual object generated according to said changed position and orientation, with pictures of real space.

11. An information processing method according to
Claim 10, wherein a virtual image indicating said input
virtual shape is synthesized with said pictures of real
space.

12. An information processing method according to
Claim 10, wherein said constraining shape is a plane.

13. An information processing method according to
Claim 10, wherein change of the position and orientation of
said virtual object is carried out by changing the position
and orientation of said operating unit.

14. A computer program, wherein the information
processing method according to Claim 10 is executed by a
computer device.

15. A computer-readable recording medium, storing the
computer program according to Claim 14.